

Comment on “Charting a Path Forward: Assessing the Science of Chemical Risk Evaluations under the Toxic Substances Control Act in the Context of Recent National Academies Recommendations”

Anthony Tweedale¹ 

¹Rebutting Industry Science with Knowledge (RISK) Consultancy, Brussels, Belgium

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McPartland et al.¹ discussed the initial 10 risk assessments (RAs) conducted by the U.S. Environmental Protection Agency (EPA) under the 2016 revisions to the Toxic Substances Control Act (TSCA). They noted the obligation of regulators to select, for each regulatory end point, the most sensitive, reliable toxicity study (“key study”) upon which to base the safe dose. However, they did not address how the U.S. EPA’s key studies were selected without evaluating the vast majority of each chemical’s hundreds to thousands of published toxicity findings. Worse, this is the globally ignored norm in premarket RAs.

Section 1.5 of each TSCA RA has a link to a bibliography of studies initially considered. However, the U.S. EPA says in each RA that they do not have the resources to evaluate so many studies. For example, for the solvent trichloroethene, the agency reviewed only 180 of 6,049 human hazard studies they found, then added 95 from previous RAs (a significant fraction of the 95 are by industry authors).² Such practices violate 2016 TSCA’s mandate, where the U.S. EPA chose systematic review to perform each RA.³ A systematic review applies objective criteria to evaluate the internal validity of “all available information” (AAI), so AAI is acknowledged as all-important to a systematic review.⁴

Even where laws explicitly require the evaluation of AAI—for example, Article 8(5) of the European Union’s pesticide authorization law and Annex VI of the Registration, Evaluation, Authorisation and Restriction of Chemicals law—audits by nongovernmental organizations show that randomly selected dossiers for hundreds of high production volume chemicals contain not even one of the many published toxicity findings for these chemicals. On average, they contain fewer than 20% of the relevant articles in PubMed.^{5,6}

In the late 1970s, the Organisation for Economic Co-operation and Development (OECD) identified best practices in toxicity testing methods.⁷ Only industry members participated in those meetings (R. Viser, personal communication), so industry test methods were enshrined as OECD’s Test Guidelines (TGs)⁷ (corresponding to the U.S. EPA’s Test Methods). Any new test ordered by a regulator in an OECD or supporting country must use the TG protocols. Critically, TG studies are not always reproducible,⁸ given that they are required to test unrealistically high doses (despite the rising ubiquity of low-dose toxicity findings) and fail to allow for the latency of chronic diseases.⁹

A large prospective Columbia University cohort found associations between chlorpyrifos exposure and neurodevelopmental deficits.¹⁰ Those saying chlorpyrifos is too risky frequently cite

only this study, allowing those opposed to say that the finding is only a correlation. Yet, of 2,300 chlorpyrifos experimental toxicity findings (of any design) that I found in PubMed, 39.2% were low-dose toxicity (analysis unpublished). The lowest dose effect was metabolic: 0.001 mg/kg body weight/d in rats dosed for 90 d via drinking water.¹¹

Focusing on only epidemiology, use, or exposure is insufficient for an RA. RA is a linear, not holistic, paradigm. First all evidence must be found. Only then is systematic review (critical evaluation and evidence synthesis) worthwhile.

Editor’s Note: In accordance with journal policy, McPartland et al. were asked whether they wanted to respond to this letter, but they chose not to do so.

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Address correspondence to Anthony Tweedale. Email: ttweed@telenet.be

RISK Consultancy offers paid expertise to nonprofit advocacy groups to better focus on risk assessment in their campaigns to reduce toxic chemical use.

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